

Long Wu

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Gender: Male

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Highlights of Qualification

- Published two co-authored paper, and one first-author working paper
- Outstanding student with National Scholarship
- Solid background of mathematics, computer science
- Four-year research experiences in bioinformatics
- **Computer Skills:** Six years C/C++ programming experience; Proficient in Matlab, Python;
- **Tools:** Visual Studio 2012, Eclipse C++, Eclipse Python
- Coding in C++: more than 10000 lines;
- Coding in Python: more than 5000 lines

Education

- 9/2010 ~ 1/2014** Master's Degree of Computer Application Technology.
Institute of Computing Technology, University of Chinese Academy of Sciences
- 9/2006 ~ 9/2010** Bachelor's Degree of Mathematics and Applied Mathematics.
Harbin Institute of Technology

Work Experience

- 1/2014 ~ present** Institute of Computing Technology, as a visiting student
Developing a software to detect precursors;
Prepare papers of pParse 2.0;
Guide student as a research assistant.

Publications

Published Papers

- Hao Chi, Hai-Feng Chen, Kun He, **Long Wu**, Bing Yang, Rui-Xiang Sun, Jian-Yun Liu, Wen-Feng Zeng, Chun-Qing Song, Si-Min He, and Meng-Qiu Dong. pNovo+: de novo peptide sequencing using complementary HCD and ETD tandem mass spectra. *Journal of Proteome Research* 2013, 12, (2), 615-25 (**IF > 4**)
- Zuo-Fei Yuan, **Long Wu**, Chao Liu, Hao Chi, Sheng-Bo Fan, Kun Zhang, Wen-Feng Zeng, Rui-Xiang Sun, Si-Min He. Accurate Determination of Precursor Ions for Peptides in Large-scale Protein Identification. *Progress in Biochemistry and Biophysics*. 2013, 40, (1), 80-92.

Working Papers

- Long Wu**, Wen-Feng Zeng, Zuo-Fei Yuan, Kun Zhang, Jia-Ming Meng, Sheng-Bo Fan, Chao Liu, Hao Chi, Rui-Xiang Sun, Lai-Yun Qing, and Si-Min He. pParse 2.0: more sensitive and faster detection of monoisotopic peaks.

Awards and Honors

- National Scholarship (2006), Top 1%
- People's Scholarship (2007, 2008, 2009)
- Outstanding Student (2007) Top 1%
- Honorable Mention in MCM/ICM Contest (2009)
- JianKe Elite Scholarship (2010)

Research Experiences

12/2010 ~ present: More sensitive and fast detection of precursor monoisotopic peaks

(Advisor: Si-Min He)

- Analysis over 200GB mass spectra data to identify more proteins;
- Develop software tools for detection of monoisotopic peaks of tandem mass spectra
 - Coding in C++: more than 9000 lines;
 - Research and extract appropriate features;
 - Design a preliminary scoring function;
 - Design a fine scoring function for all the candidate precursors by MARS;
- Compare pParse 2.0 with pParse and MaxQuant;
 - pParse 2.0 is more sensitive while exporting less false positive precursors than MaxQuant and pParse;
 - pParse 2.0 is about 10 times faster than pParse 1.0 and MaxQuant.

4/2013 ~ present: Detect and reduce the systematic error of precursor mass

- Research the distribution of mass errors;
- Develop software tools (more than 3000 lines of C++ code);
- Propose a recalibrating algorithm based on locally weighted scatterplot smoothing method;
- The speed is twice faster than the state-of-the-art algorithm MaxQuant. The accuracy is very close or equal to MaxQuant on different data sets.

1/2014 ~ 6/2014: Extend pParse 2.0 software tool

(Advisor: Si-Min He)

- Extend pParse 2.0 and get pParse(15N) to deal with 15N-labeling data sets;
- Extend pParse 2.0 to Top-Down data sets with collogues and get pParse(TD);
- Extend pParse 2.0 to Wiff format data with an undergraduate senior student and get pParse(Wiff).

9/2009 ~ 7/2010: Solve the Multi-exponential Decay Signals

(Advisor: Qi Guo)

- Solve ill-posed linear equations;
- Propose an algorithm to get an approximate solution of ill-posed linear equations. (Published)

Extracurricular Activities

11/2012: Tutorial section of the 2nd China Workshop on Computational Proteomics

- Introduce the usage of pFind software tools;
- Compare different strategies to search the mass spectra data sets;
- Introduce some skills to analysis mass spectra data sets;

1/2009: Participant the 2009 MCM/ICM Contest

- Build a linear ordinary differential equation to simulate an ecosystem;
- Solve the equation and get the solution for maintaining ecological equilibrium;
- Get Honorable Mention;

Research Interests

Bioinformatics; Machine learning algorithms; Probability and statistics;

Personal Skills

Foreign Language: English; Passed CET-6;

Programming Language: C++, Python, and MATLAB;

Familiar with machine learning algorithms, such as SVM, Adaboost and so on;

Familiar with basic data structures and skills to design algorithms;

Familiar with GNU/Linux Operating System;